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Study Guide

Student Edition
Pages 514–519

Polynomials

A **polynomial** is a monomial or a sum of monomials. A **binomial** is the sum of two monomials, and a **trinomial** is the sum of three monomials.

Examples of each type of polynomial are given in the following chart.

Monomial	Binomial	Trinomial
$5x^2$	$3x + 2$	$5x^2 - 2x + 7$
$4abc$	$4x + 5y$	$a^2 + 2ab + b^2$

The **degree** of a monomial is the sum of the exponents of its variables.

Monomial	Degree
$5x^2$	2
$4ab^3c^4$	$1 + 3 + 4 = 8$

To find the degree of a polynomial, first find the degree of each of its terms. The degree of the polynomial is the greatest of the degrees of its terms. The terms of a polynomial are usually arranged so that the powers of one variable are in either ascending or descending order.

Ascending Order: $3 + 5a - 8a^2 + a^3$
Descending Order: (in x) $x^5y^2 - x^4 + x^3y^2 + 5xy$

Find the degree of each polynomial.

1. $4x^2y^3z$ **2.** $-2abc$ **3.** $15m$

4. $s + 5t$ **5.** 22 **6.** $18x^2y + 4yz - 10y$

7. $x^4 - 6x^2 - 2x^3 - 10$ **8.** $2x^3y^2 - 4xy^3$ **9.** $-2r^8s^4 + 7r^2s - 4r^7s^6$

Arrange the terms of each polynomial so that the powers of x are in descending order.

10. $24x^2y - 12x^3y^2 + 6x^4$ **11.** $20x - 10x^2 + 5x^3$ **12.** $9bx + 3bx^2 - 6x^3$

13. $-15x^3 + 10x^4y^2 + 7xy^2$ **14.** $ax^2 + 8a^2x^5 - 4$ **15.** $x^5 + x^2 - x^3$

Arrange the terms of each polynomial so that the powers of x are in ascending order.

16. $x^4 + x^3 + x^2$ **17.** $2x^3 - x + 3x^7$ **18.** $-5cx + 10c^2x^3 + 15cx^2$

19. $3 + 9x^4 + 9x^3$ **20.** $-4nx - 5n^3x^3 + 5$ **21.** $4xy + 2y + 5x^2$